

On the structure and stability of traveling wave solutions for the generalized Korteweg-de Vries-Burgers equation in a case of a flow function with four inflection points

Tomasheva A M and Shargatov V A[®]

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Kashirskoe Shosse 31, Moscow 115409, Russia

[®] tassio@yandex.ru

We investigated the structure and stability of the solution set in the form of a traveling wave for the generalized Korteweg-de Vries-Burgers equation with a flow function having four inflection points. The solution can have five different endpoints of the phase trajectory for the same wave velocity and different dissipation coefficients. Some endpoints can be saddles and correspond to solutions for a special (nonclassical) discontinuity structure. This is the first time an example of the existence of two monotone structures of special discontinuities propagating with different velocities is presented. Both structures of nonclassical discontinuities in the case under consideration are linearly stable. The linear stability of the structures of classical and special discontinuities was investigated by means of a method based on the Evans function.

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